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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.     | CONFIRMATION NO.       |
|--|-------------|----------------------|-------------------------|------------------------|
| 10/675,693   | 09/30/2003  | Hui-Ling Lou         | MP0321                  | 1055                   |
| 26703  | 7590        | 09/28/2007           |                         |                        |
| HARNESS, DICKEY & PIERCE P.L.C.<br>5445 CORPORATE DRIVE<br>SUITE 200<br>TROY, MI 48098 |             |                      | EXAMINER<br>HA, DAC V   |                        |
|  |             |                      | ART UNIT<br>2611        | PAPER NUMBER           |
|  |             |                      | MAIL DATE<br>09/28/2007 | DELIVERY MODE<br>PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/675,693             | LOU ET AL.          |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Dac V. Ha              | 2611                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 July 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-95 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-95 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

1. This office action is in response to the amendment filed on 07/06/07.

### *Response to Arguments*

2. Applicant's arguments with respect to claims 1-85 have been considered but are moot in view of the new ground(s) of rejection.

### *Double Patenting*

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1, 17, 35, 47, 61, 73 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 7,133,473. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed subject matter in claims 1, 17, 35, 47, 61,

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73 would have been easily realized by one skilled in the art based on Patent No. 7,133,473. For example, claim 1 of the instant application calls for "demultiplexer" "that generates in-phase and quadrature components of said demodulated symbol sequence". Such claimed subject matter would have been obvious to one skilled in the art as application specific. That is, when the received signal is of the type i.e. QAM modulated signal, such step would have been obvious at the receiving end.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-95** are rejected under 35 U.S.C. 103(a) as being unpatentable over Claydon et al. (US 6,154,871) (hereafter Claydon) in view of El-Gamal et al. (US 7,010,054) (hereafter El-Gamal).

**Regarding claims 1, 35, 61, 62**, Claydon discloses all claimed subject as followed:

"a demodulator that generates a demodulated symbol sequence by derotating a signal constellation of a received symbol sequence; a dimension demultiplexer that communicates with said demodulator and that generates in-phase and quadrature components of said demodulated symbol sequence; and a branch metric computation module that communicates with said dimension demultiplexer and that generates branch metrics based on said in-phase and quadrature components" in Fig. 2, all

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elements; col. 2, lines 1-55; col. 3, lines 31-57, wherein the receiver in Fig. 2 discloses both the derotating of the received signal and generation of the quadrature signal components.

Claydon differs from the present invention in that it does teach "decoded based on a space-time block code". However, El-Gamal disclose the use of such code in Fig. 3, element 305. Space-time code is known to provide robust error correcting performance over various time-varying channels including spatial diversity. Thus, it would have been a desire for one skilled in the art to incorporate the use of space-time code taught by El-Gamal into Claydon to improve the robustness of the receiver.

**Regarding claim 2, 36,** Claydon further discloses "a Viterbi decoder that communicates with said branch metric computation module and that generates a user data sequence based on said branch metrics" in Fig. 14, col. 4, lines 37-40.

**Regarding claims 4, 38, 64,** the claimed subject matter "wherein said Viterbi decoder generates said user data sequence by determining a minimum of a plurality of path metrics that comprise accumulations of said branch metrics" is inherent of the Viterbi decoding process.

**Regarding claims 5, 39, 65,** similar to that of claim 4.

**Regarding claims 11, 41, 67,** Claydon further discloses the claimed subject matter "wherein said signal constellation ... 256-QAM" in Abstract.

**Regarding claims 17, 18, 47, 48, 73, 74,** see claim 1.

**Regarding claims 6-10, 12-16, 37, 40, 42-46, 63, 66, 68-72,** these claimed subject matter would have been easily realized by one skilled in the art as application specific/preferences.

**Regarding claims 19, 49,** Claydon further discloses "said space-time block decoder includes a dimension demultiplexer that communicates with said demodulator and said branch metric computation module and that generates said in-phase and quadrature components" in Fig. 2, all elements; col. 2, lines 1-55; col. 3, lines 31-57.

**Regarding claims 21,** Claydon further discloses "a Viterbi decoder that communicates with said branch metric computation module and that generates a user data sequence based on said branch metrics" in Fig. 14, col. 4, lines 37-40.

**Regarding 20, 22-28, 30-34, 50, 52-54, 56-60, 75, 77-79, 81-95,** these claimed subject matter would have been easily realized by one skilled in the art as application specific/preferences.

**Regarding claims 29, 55, 80,** Claydon further discloses the claimed subject matter "wherein said signal constellation ... 256-QAM" in Abstract.

**Regarding claim 76,** Claydon further discloses the claimed subject matter "generating said user data based on said branch metric" in col. 2, lines 1-55; col. 3, lines 31-57.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bevan et al. (US 6,891,897).

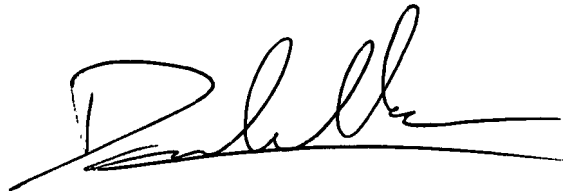
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dac V. Ha whose telephone number is 571-272-3040.

The examiner can normally be reached on 4/4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Dac V. Ha', with a long horizontal line extending to the right.

Dac V. Ha  
Primary Examiner  
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